



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,924	05/24/2002	Christopher L. Bohler	GLO 2 0075	6169
27885	7590	12/19/2003	EXAMINER	
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			SAWHNEY, HARGOBIND S	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 12/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/063,924

Applicant(s)

BOHLER ET AL.

Examiner

Hargobind S Sawhney

Art Unit

2875

u

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(s). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-22, 25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-22, 25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) and (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. The amendment filed on August 26, 2003 has been entered. Accordingly:
 - The specification and abstract have been amended;
 - Claims 1,3-5, 7-15 and 17-22 have been amended;
 - Claims 6,23 and 24 have been cancelled; and
 - Formal drawings filed on August 26, 2003 have been entered.

Allowable Subject Matter

2. The indicated allowability of claims 3,4,7,10,12,14, and 16 is withdrawn in view of the newly discovered reference(s) to Serizewa et al. (US Patent No.: 4,733,335), Jannings (U.S. Patent No. 3,275,874), Opolka (German Patent No. DE 20004105 U1) and Sylvester et al. (U.S. Patent No. 6,160,596). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by Serizewa et al. (US Patent No.: 4,733,335).

Serizewa et al. ('335) discloses a light module (Figures 1-3) comprising:

- a light emitting diode (LED) assembly defining a front side LED array 111 including elements 124 and 125 (Figures 8 and 9) and a rear side – the side bearing the element 152 (Figure 8) hereafter referred as the rear side 152;
- the rear side 152 further thermally communicating with the thermally conductive spreader 153 (Figures 8 and 9, column 8, lines 34 and 35);
- a plurality of appendages 163 (Figures 8 and 9, column 8, lines 58-60) thermally communicating with the thermally conductive spreader 153 (Figures 8 and 9, column 8, lines 58-60)
- a housing 113 (Figures 8 and 9, column 8, lines 34 and 35) surrounding the front side of the LED array 111 (Figures 8 and 9);
- an optic 125 (Figures 8 and 9, column 8, lines 32 and 33, and column 8, line 32) removably affixed to the housing 113 opposite to the LED array 111 (Figures 8 and 9); and
- the optic 125 further including a plurality of lenslets (Figure 8) corresponding to the LEDs 111 (Figures 8 and 9, column 8, lines 45-49), and positioned in front of the LED array 111.

5. Claims 17-19, are rejected under 35 U.S.C. 102(e) as being anticipated by Reisenaur et al. (U.S. Patent No. 6,161,910).

Regarding claims 17-19, Reisenaur et al. ('910) a light emitting diode assembly (Figures 1-3) comprising:

- a light emitting diode (LED) face 26 (Figures 1-3, column 3, line 38) supported by a body 16 (Figures 1-4, column 3, line 35; and column 4, lines 3 and 4) passaging electrical connection elements 11 (Figures 2-4);
- the body 16 further comprising a thermally conductive core 28 (Figures 1-3, column 4, lines 11, and 35-37) in thermal communication with the light emitting face 26 (Figures 2 and 3, column 4, lines 9-13); and
- a plurality of thermally conductive attachments on a plate 30 comprising fins surroundingly attached to the thermally conductive core 28 (Figures 3 and 4, column 4, lines 9-14) parallel to the central axis of the thermally conductive core 28 (Figure 3).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1,2,5,8-11, 13 and 16, are rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view of Jannings (U.S. Patent No. 3,275,874).

Regarding Claim 1, Reisenaur et al. ('910) discloses a light module (Figures 1-3) comprising:

- a light emitting diode (LED) assembly 10 (Figures 1-3, column 3, line 1) defining a front side LED array 26 (Figures 1-3, column 3, line 38) and a rear side – the side bearing an LED circuit board - 22 (Figure 2);
- the rear side 22 thermally communicating with the thermally conductive spreader 84 (Figures 1-3, column 4, lines 35-37);
- a thermally conductive elongated core 28 (Figures 1-3, column 4, lines 11, and 35-37) in thermal communication with the thermally conductive spreader 84;
- the thermal conductive, core 28 providing means 72 (Figures 1-4, column 4, lines 24-28) for an electrical conductor 11(Figures 2 and 4) operatively communicating with the front side LED array 26; and
- a plurality of appendages - fins- positioned on the fin plate 30 (Figures 1-3, column 4, lines 11-15).

However, Reisenaur et al. ('910) does not disclose the light module including a plurality of thermally conductive appendages being positioned around the thermally conductive core, and extending in parallel of perpendicular direction in relation to the longitudinal axis of the core.

On the other hand, Jannings ('874) discloses a lighting device 10 (Figure 1) comprising thermally conductive appendage 26 (Figure 1, column 3, lines 68-72) extending around the core 11G (Figure 1).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Reisenaur et al. ('910) by providing thermally conductive appendage and their positioning as taught by Jannings ('874) for the benefits and advantages of increasing heat removal efficiency of the device.

Regarding claims 2, 5, 8, 9, 13 and 16, Reisenaur et al. ('910) in view of Jannings ('874) discloses the light module (Figures 1-3) further comprising:

- the plurality of appendages on the plate 30 (Reisenaur, Figures 1-3) being further in thermal communication with the conductive spreader 84 (Reisenaur, Figures 1-3);
- the plurality of appendages comprising fins (Reisenaur, Figures 1-3, column 4, lines 12 and 13) on the fin plate 30 (Reisenaur, Figures 1-3);
- the LED assembly (Reisenaur, Figures 1 and 2) further comprising individually packaged LED elements (Reisenaur, Figures 1) with each LED element having its own lens and electrically conductive elements;
- the front side LED array 26 selectively producing white light (Reisenaur, Figures 1-4, column 3, lines 38-40); and
- individually powerable sets of LEDs D11-D15; D21-D25 etc. (Figure 5, column 4, lines 65-67 and column 5, lines 1 and 2).

Regarding Claim 10, Reisenaur et al. ('910) in view of Jannings ('874) discloses the light module (Figures 1-3) further comprising the plurality of appendages comprising fins (Figures 1-3, column 4, lines 12 and 13) on the fin plate 30 (Reisenaur, Figures 1-3). However, neither combined nor individual teaching of Reisenaur et al. ('910) and Jannings ('874) discloses the light module having thermal resistivity less than 40 degree per watt.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to thermally size the thermal sink surface with required number and size of fins, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding Claim 11, Reisenaur ('910) in view Jannings ('874) of teaches a thermally conductive core and thermally conductive conductors being accommodated in a reading assembly in an aviation assembly. However, Reisenaur ('910) does not teach a thermally conductive core and thermally conductive conductors being accommodated in a fixture selected from the set consisting of MR- style fixtures and PAR -style fixtures.

It has been held that a recitation with respect to the manner in which a claim apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Serizewa et al. (US Patent No.: 4,733,335) in view of Opolka (German Patent No. DE 20004105 U1).

Regarding Claim 4, dependent on Claim 3, Serizewa et al. ('335) discloses a light module comprising a housing containing an optic in front of an LED array. However, Serizewa et al. ('335) does not teach the housing providing variable spacing between the optic and the LED array.

On the other hand, Opolka (German Patent No. DE 20004105 U1) discloses an LED lamp 10 (Figure 1) comprising a housing 18 providing variable spacing between the lens 23 and the LED array 24 (Figure 2 and English translated abstract).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Serizewa et al. ('335) by providing a housing providing variable spacing between the lens and the LED array as taught by Opolka for the benefit of varying intensity of light emitted from the LEDs.

9. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view Jannings (U.S. Patent No. 3,275,874) as applied to Claim 1 above, and further in view of Sylvester et al. (U.S. Patent No. 6,160,596).

Regarding claims 12 and 14, dependent on Claim 1, neither combined nor individual teaching of Reisenaur et al. ('910) and Jannings ('874) specifically teaches the light produced by the LEDs being of saturated color with a narrow wavelength. Further, neither combined nor individual teaching of Reisenaur et al. ('910) and Jannings ('874) teaches the light produced by the LEDs being of desaturated color produced by mixing the LEDs emitting saturated colors.

On the other hand, Sylvester et al. ('596) discloses a back lighting system (Figure 5). In the "Background of Invention" Sylvester et al. ('596) teaches:

Conventional LEDs produce substantially saturated colors including only a small range of wavelength (Column 2, lines 24-41); and mixing of saturated LED colors produce a desaturated target color (Column 2, lines 24-41).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Reisenaur et al. ('910) I view of Jannings ('874) by providing conventional LEDS of one color to produce saturated color of the need, and provide LEDs emitting light of different colors to produce the desaturated color of need as taught by Sylvester et al. ('596).

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view Jannings (U.S. Patent No. 3,275,874) as applied to Claim 1 above, and further in view of Pederson (US Patent No. 6,367,949).

Neither combined nor individual teaching of Reisenaur ('910) and ('874) teaches a front side LED array but does not discloses specific rating in terms of lumens of the LED array. On the other hand, Pederson ('949) discloses a LED utility lamp 10 (Figure 1) comprising a LED array 16 (Figure 1, column 11, lines 27 and 28) providing energy light output of between 20 and 200 lumen (Figure 1, column 16, lines 40-43). Pederson ('949) further teaches that the LED array may be of any size preferred by the user.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the LED array of Pederson ('949) in view of ('874) by providing

more than one LED, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view of Garufo (German Patent No. DE 19528459 A1).

Regarding Claim 20, dependent on Claim 17, Reisenaur ('910) teaches plurality of appendages (Fins) 30 (Figures 1-3, column 4, lines 11-15) positioned about the thermally conductive core 28, and comprising fins (Figures 1-3, column 4, lines 12 and 13). However, Reisenaur ('910) does not teach the plurality of appendages including rods extending away from the rear side of the LED assembly.

On the other hand, Garufo (German Patent No. DE 19528459 A1) discloses a LED light fixture (Figure 1) comprising a plurality of appendages 8 being rods (Figure 1, column 3, lines 23 and 24).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Reisenaur ('910) by providing the plurality of appendages as taught by Garufo for benefit and advantage of improved thermal rejection efficiency of the heat sink as well as operational efficiency of the LEDs.

12. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910).

Regarding Claim 21, Reisenaur et al. ('910) discloses a lamp (Figures 1-4) comprising:

- a LED assembly 10 (Figure 1-3, column 3, line 32) having forward facing side providing illumination with white light from a plurality of energized LEDs 26 (Reisenaur, Figures 1-4, column 3, lines 38-40) and a rearward facing side thermally coupled to a heat sink having elements 84,28 and 30 (Figures 1 and 2, column 4, lines 9-16 and 35-37);
- the heat sink with elements 84,28 and 30 drawing heat from the LEDs 26 (Figures 1 and 2, column 4, lines 9-16);
- the heat sink with elements 84,28 and 30 including means – exposed surface areas (fins) – (Figure 3) thermally communicating with the heat sink 30, and dissipating heat via well known the convection mode of heat transfer;
- the heat sink with elements 84,28 and 30 including a thermally conductive base 84 (Figures 1-3, column 4, lines 35-37) contacting the rearward facing of the LED assembly 26 (Figure 1);
- the heat sink with elements 84,28 and 30 including a thermally conductive core 28 (Figures 1-3, column 4, lines 11, and 35-37) extending from the thermally conductive base 84 in the direction away from the LED assembly 26; and
- the heat dissipating means – fins – being in contact with, and extending away from the heat conductive fin plate 30 (Figures 1-3, column 4, lines 11-13).

Reisenaur et al. ('910) discloses the light module including a plurality of thermally conductive members integral with the thermally conductive core. However, Reisenaur et al. ('910) does not specifically teach the plurality of thermally conductive members being interference fit with the thermally conductive core.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to recognize that the integrally molded thermally conductive member would perform equally well as a heat sink as the thermally conductive members interference fit with the core. It appears that the claimed invention would perform equally well with the thermally conductive members being interference fit with the thermally conductive core.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view of Serizewa et al. (US Patent No.: 4,733,335).

Regarding Claim 22, dependent on Claim 21, Reisenaur et al. ('910) does not teach a plurality of LEDs being disposed in reflector wells.

On the other hand, Serizewa et al. ('335) discloses a light module (Figures 1-3) comprising a light emitting diode (LED) assembly including LED array 111 disposed in reflector wells (Figure 8, column 8, lines 40-45).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Reisenaur et al. ('910) by providing reflector wells as taught by Serizewa et al. ('335) for the benefits and advantages of improving illumination efficiency with directed and reflected light from the LEDs.

14. Claims 25, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reisenaur et al. (U.S. Patent No. 6,161,910) in view of Sylvester et al. (U.S. Patent No. 6,160,596).

Regarding claims 25 and 26, dependent on claims 21 and 25 respectfully, Reisenaur et al. ('910) does not specifically teach the light produced by the LEDs being of saturated color with a narrow wavelength. Further, Reisenaur et al. ('910) does not teach the light produced by the LEDs being of desaturated color produced by mixing the LEDs emitting saturated colors.

On the other hand, Sylvester et al. ('596) discloses a back lighting system (Figure 5). In the "Background of Invention" Sylvester et al. ('596) teaches:

Conventional LEDs produce substantially saturated colors including only a small range of wavelength (Column 2, lines 24-41); and Mixing of saturated LED colors produce a desaturated target color (Column 2, lines 24-41).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the light module of Reisenaur et al. ('910) by providing conventional LEDS of one color to produce saturated color of the need, and provide LEDs emitting light of different colors to produce the desaturated color of need as taught by Sylvester et al. ('596).

Response to Amendment

15. Applicant's arguments filed on August 26, 2003 with respect to the 35 U.S.C. 102(e) rejections of claims 1, 3, 17 and 21 have been fully considered but they are not considered but are moot in view of the new ground(s) of rejections.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Trentelman (U.S. Patent No. 6,429,581 B1), Hamilton et al. (U.S. Patent No. 5,852,339), Schmutz (U.S. Patent No. 5,612,821) and Figari (U.S. Patent No. 4,784,258) each discloses an LED lamp comprising some of the claimed features claimed by the applicant.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hargobind S Sawhney whose telephone number is 703-306-5909. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M.

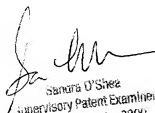
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9319 for After Final communications.

Art Unit: 2875

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2956.

HSS

November 16, 2003


Samara O'Shea
Supervisory Patent Examiner
Technology Center 2800